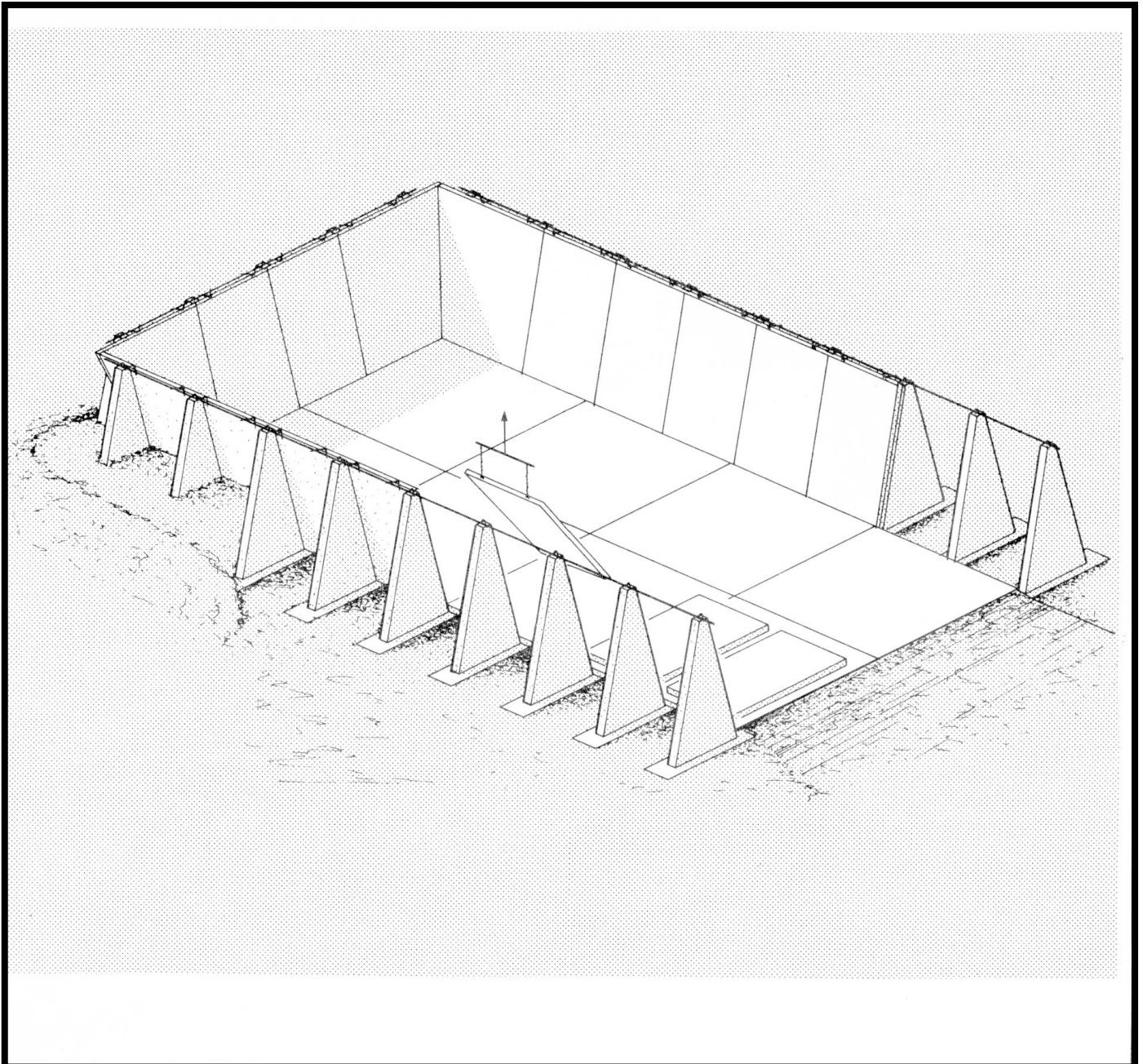


OPEN TOP PRECAST CONCRETE WALL BUNKER SILO 8 TO 20 FT. WALL (TILTUP)



DEVELOPED BY CANADA PLAN SERVICE

ABOVE-GROUND HORIZONTAL SILO

CPS
PLAN M-7435 REV. 88:08

This plan gives construction details for a tilt-up concrete horizontal silo designed for tractor packing. It can be built in any length and width that are multiples of 2.4 m (8 ft) and with wall heights from 2.4 m to 6.0 m (8 to 20 ft). The buttresses and wall panels are built with a minimum of forming because they are cast flat on the concrete floor slab and then lifted into position after curing.

The concrete buttress, footings and walls will handle silage and tractor-packing pressures to be published in the Canadian Farm Building Code. Packing pressure is based on a maximum tractor one-wheel load of 1600 kg (3500 lb) or a total four-wheel load of 4600 kg (10 000 lb).

SILO LOCATION AND CONSTRUCTION

1. Choose a site with firm, well-drained soil with an estimated bearing capacity at least 100 kPa (2000 lb/ft²) to support the slab floor and buttress footings.
2. Locate on high ground remote from the farmhouse, milk room and other odor-sensitive areas.
3. Face the open end south if possible to minimize freezing, and locate the open end adjacent to a good farm roadway for easy filling and unloading.

FILLING PROCEDURE Fill the silo as quickly as possible. Pack with a tractor during filling to squeeze out air and reduce spoilage. Cover the silage with heavy polyethylene plastic film at the end of each day of filling to cut off the oxygen supply and reduce ensiling losses.

SEALING When filling is completed, seal the exposed silage surfaces quickly with plastic, taped at all lap joints and tucked in at the edges. Secure the plastic tightly with a full layer of bales or old tires to keep it

from billowing in the wind. Earth also can be used to hold the plastic in place, but is more difficult to remove and can get mixed into the silage.

UNLOADING Mechanical unloaders designed specifically for horizontal silos remove the silage smoothly and do a good pulverizing and mixing job. A tractor with a front-end loader is more versatile, but tends to remove frozen silage in chunks that are difficult to feed.

SEEPAGE Harvest silage below 70% moisture (or field-wilt after cutting) to reduce seepage losses and minimize freezing problems.

SILO DIMENSIONS AND CAPACITIES In sizing a silo, consider the following:

1. Approximately 15% of the silage stored in horizontal silos is lost due to fermentation and handling.
2. To prevent spoilage at the open face, build the silo long enough so that at least 75 mm (2 in.) of silage can be used per day in winter and 100 mm (4 in.) in summer.
3. If one silo is too long for the site, build two or more silos side by side with shared walls and supports between them.
4. Widths less than 9 m (30 ft) and heights above 3.6 m (12 ft) are unsuitable for removal of silage by a front-end loader.
5. Calculate silo storage capacity based on a settled dry-matter density of 220 kg/m³ (14 lb/cu ft) if tractor packed, or 160 kg/m³ (10 lb/cu ft) if unpacked. For converting to wet density, multiply dry-matter densities by the following wet-density factors:

Silage moisture		Wet density factor
%	Water fraction	
60	3/5	2.5
67	2/3	3.0
75	3/4	4.0

6. Feed adult dairy and beef cows approximately 12 and 10 kg (26 and 22 lb) of silage dry matter per day, respectively, when silage is the only roughage fed. See Table 1 for dry matter capacity of packed horizontal silos.

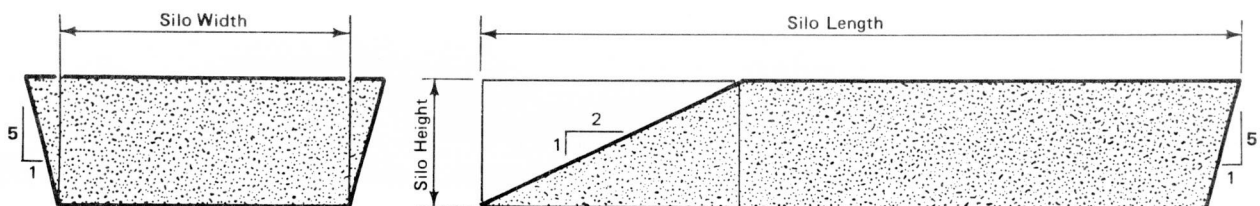


FIGURE 1. HORIZONTAL SILO SECTIONS

TABLE 1. DRY MATTER CAPACITY OF PACKED HORIZONTAL SILOS

Silo width, (m)	Wall height (m)	Dry matter storage capacity (tonnes)							
		Silo length (m)*							
		19.2	24.0	28.8	33.6	38.4	43.2	48.0	52.8
9.6	2.4	84	108	131	155	180	202	225	249
	3.6	124	161	198	234	274	308	345	382
12.0	2.4	105	134	163	192	223	250	279	308
	3.6	153	198	244	289	338	380	425	471
	4.8	196	258	320	383	450	507	569	632
14.4	3.6		236	290	344	402	452	506	560
	4.8		306	380	454	534	602	675	749
	6.0		370	465	559	661	747	842	936
19.2	3.6			382	453	530	596	667	738
	4.8			499	596	701	790	887	984
	6.0			608	732	865	978	1102	1225
24.0	3.6				563	658	739	828	916
	4.8				739	869	979	1099	1219
	6.0				904	1069	1209	1361	1514

(ft)	(ft)	Dry matter storage capacity (tons)							
		Silo Length (ft)							
		64	80	96	116	128	144	160	176
32	8	93	119	144	171	198	223	248	274
	12	137	177	218	258	302	339	380	421
40	8	116	148	180	212	246	276	308	339
	12	169	218	269	319	373	419	468	519
	16	216	284	353	422	496	559	627	697
48	12		260	320	379	443	498	558	617
	16		337	419	500	589	663	744	825
	20		408	512	616	728	823	928	1032
64	12			421	499	584	657	735	813
	16			550	657	773	871	978	1084
	20			670	807	953	1078	1214	1350
80	12				620	725	814	912	1009
	16				814	958	1079	1211	1343
	20				996	1178	1332	1500	1668

* For unpacked capacities, multiply above capacities by 0.7.